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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/541,011

12/20/2005

Ashutosh Joshi

0-05-106

9060

7590 03/27/2008  
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EXAMINER

WONG, EDNA

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/27/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/541,011	<b>Applicant(s)</b> JOSHI ET AL.	
	<b>Examiner</b> EDNA WONG	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 8-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

This is in response to the Amendment dated January 16, 2008. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

### ***Response to Arguments***

#### **Claim Objections**

Claim **1** has been objected to because of minor informalities.

The objection of claim 1 has been withdrawn in view of Applicants' amendment.

#### **Claim Rejections - 35 USC § 112**

**I.** Claims **1-2, 4-6 and 8-18** have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection of claims 1-2, 4-6 and 8-18 under 35 U.S.C. 112, first paragraph, has been withdrawn in view of Applicants' amendment.

**II.** Claims **11-18** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 11-18 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

I. Claims **1-2, 4-6 and 8-17** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **CS 274995** ('995) in combination with **Parrish** (US Patent No. 6,793,903 B1).

The rejection of claims 1-2, 4-6 and 8-17 under 35 U.S.C. 103(a) as being unpatentable over CS 274995 ('995) in combination with Parrish is as applied in the Office Actions dated November 21, 2006, June 14, 2007 and October 12, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that the publication discloses a method for a photocatalytic degradation of the complexing agent, such as EDTA, by partly reacting said agent with iron or copper or nickel, thus producing an organic metalo-complex catalyst, such as Fe-EDTA. Ions  $\text{Fe}^{+2}$  or other ions are added but it is known that they are chelated in the complexes.

In response, CS '995 teaches:

Compounds that forms solid complexes with ***a number of metal ions also occur in wastewater from industrial processes***. Metals bound in complexes generally cannot be removed from solutions by means of standard chemical processes during the treatment of these wastewaters and are the reason for the escape of metal

ions into the waste flow (page 2, lines 19-23).

The basis of the CS '995 invention consists of ***the photocatalytic oxidation degradation of several complexation agents*** such as the ***disodium salt of*** ethylenediamine tetra-acetic acid, ***the sodium salt of*** sodium N,N-methyldithiocarbamate, ***sodium*** benzoate and ***phenol*** with use of oxygen (air) as the oxidizing agent (page 3, lines 13-17).

On the other hand, ***if we are talking about discharges of wastewaters that contain free complexation agents into the water flow***, the sludge that contains the metals, including heavy metals in an insoluble form generally leads to re-introduction of the metals into solution and to secondary contamination of the water flow when these substances come into contact with the sediment (page 3, lines 1-6).

CS '995 also teaches:

**Example 4**

Cupral in the amount of 0.90 grams, which corresponds to the upper limit of concentration in rinse water from galvanic processes, was placed in the quartz photochemical reactor together with 76 mg of  $\text{Cu}^{2+}$  in the form of  $\text{CuSO}_4$  and dissolved in 4,000 ml of water. Prior to the start of radiation, hydrogen peroxide in the amount of 0.136 grams was added to the solution to initiate the beginning stage of the reaction. From this point, the process was carried out as in Example 2. After 60 minutes of irradiation, 0.71 grams of the cupral, or 79.3%, had broken down.

(pages 5-6).

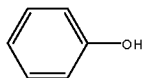
**Example 7**


Phenol in the amount of 0.38 grams was placed in a quartz photochemical reactor together with 67 mg of  $\text{Fe}^{2+}$  in the form of  $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$  and dissolved in 4,000 ml of water. Prior to starting the radiation, hydrogen peroxide in the amount of 0.136 grams, which initiates the beginning stage of the reaction, was added. The process then proceeded in accordance with Example 1. The course of phenol breakdown was monitored by means of high-pressure liquid chromatography. After 30 minutes of radiation, 0.33 grams, that is, 88%, of the phenol had been broken down.

(page 7).

The complex-forming substances that CS '995 teaches include  $\text{Na}^{2+}$ -EDTA,  $\text{Na}^{2+}$ -Metam,  $\text{Na}^{2+}$ -benzoate and phenol. The photochemical degradation of these complex-forming substances in the wastewater would have prevented the complexing of these compounds with the metal ions in the wastewater, and thus, would have prevented the production of insoluble sludge.

Cupral (sodium N,N-diethyldithiocarbamate) [pages 5-6, Example 4] is already an organic metalo-complex. Why would one of ordinary skill in the art want to substitute the  $\text{Na}^{2+}$  ion in Cupral with the  $\text{Cu}^{2+}$  in the form of  $\text{CuSO}_4$  (the photocatalyst)? Does Cupral not photochemically degrade unless it is complexed with  $\text{Cu}^{2+}$ ?



Phenol (  ) [page 7, Example 7] is not an organic metalo-complex. Why

would one having ordinary skill in the art want to substitute the H in the OH group in phenol with the  $\text{Fe}^{2+}$  in the form of  $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$  (the photocatalyst)? Does phenol not photochemically degrade unless it is complexed with  $\text{Fe}^{2+}$ ?

Applicants state that if substituting Fe in Fe-EDTA by Mg, and EDTA by O, MgO might have been obtained but no success would be expected with such a strange combination. The '995 reference teaches its catalyst is an organic complex or metallic ion (depending on the interpretation).

In response, there is no teaching in CS' 995 that the complex-forming substances, which are already organic metalo-complexes or phenol, would either had their metal ions **re-substituted** with another metal ion (i.e.,  $\text{Na}^{2+} \rightarrow \text{Cu}^{2+}$ ); or **substituted** with a metal ion (i.e.,  $\text{H} \rightarrow \text{Fe}^{2+}$ ). CS '995 is photochemically degrading the complex-forming substances as is, because removing them from the wastewater as is, would have prevented the complex-forming substances to complex with metal ions (including heavy metal ions) which would have produced insoluble sludge. This is the Examiner's interpretation of CS '995.

Applicants state that the instant invention teaches neither organic complex nor metal ions, nor irrelevant oxide surface, but a highly relevant inorganic - nonionic -

suspended MgO, which is important as synergistically working with other factors.

The instant invention is characterized by a reaction comprising:

oxygen

magnesium oxide

UV

hydrogen peroxide.

In response, CS '995 teaches a photochemical reactor containing:

oxygen

**$\text{Cu}^{2+}$**  in the form of  $\text{CuSO}_4$  (pages 5-6, Example 4) or  **$\text{Fe}^{2+}$**  in  
the form of  $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2$  [page 7, Example 7]

UV

hydrogen peroxide.

Parrish teaches ***decomposition catalysts including Fe(II), Cu(II) and MgO***  
(col. 3, lines 28-35).

Although CS '995 teaches photochemically degrading Cupral (pages 5-6, Example 4) and phenol (page 7, Example 7), the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert. denied*, 500 US 904 (1991); and MPEP § 2144.



The Examiner notes that the substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. *In re Fount* USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. V. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Applicants state that a skilled person is automatically supposed to select MgO from many suggested, and more preferred materials in Parrish; if there is no reason for MgO and EDTA not to create hydroxyl radicals, one wonders why glass or platinum black of Parrish would not create the radicals too. But there is one principal reason for a person skilled in art not to select MgO from many Parrish's recited materials, it is known that MgO cannot exist side by side with the complexing agents, such as EDTA, of '995; a skilled person is aware of the fact that minor amounts of MgO would have been immediately sequestered by the EDTA which is in molar excess over the catalytic metals (see the abstract of '995), Mg would become a part of Mg-EDTA complex - no MgO would exist there any more.

In response, would MgO exist side by side with the complexing agents Cupral and phenol? Would MgO have been immediately sequestered by Cupral and phenol?

Applicants state that the fact is that the '995 reference does not claim hydrogen peroxide [line 6 on page 4] and does not exemplify it in 8 of 10 experimental examples.

In response, the reason or motivation to modify the reference may often suggest

what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F.2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1990), *cert. denied*, 500 US 904 (1991); and MPEP § 2144.

Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP § 2123 (II)).

Applicants state that no overlap can be seen between the two teachings, and even if adding MgO to Parrish as a taught possibility, it is difficult even in hindsight to combine the features from the two sources so as to come close to the instant invention.

In response, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

II. Claim **18** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **CS 274995** ('995) in combination with **Parrish** (US Patent No. 6,793,903 B1) as applied to claims 1-2, 4-6 and 8-17 above, and further in view of **DD 51638** ('638).

The rejection of claim 18 under 35 U.S.C. 103(a) as being unpatentable over CS 274995 ('995) in combination with Parrish as applied to claims 1-2, 4-6 and 8-17 above, and further in view of DD 51638 ('638) is as applied in the Office Actions dated November 21, 2006, June 14, 2007 and October 12, 2007 and incorporated herein. The rejection has been maintained for the reasons as discussed above.

Applicants' remarks have been fully considered but they are not deemed to be persuasive.

***Response to Amendment***

***Claim Rejections - 35 USC § 112***

I. Claims **1-2, 4-6 and 8-18** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1

line 10, recites "powdered MgO".

Applicants' specification, pages 1-10, does not disclose powdered MgO. Thus, there is insufficient written description to inform a skilled artisan that applicant was in possession of the claimed invention as a whole at the time the application was filed.

The Examiner has carefully considered the entire specification as originally filed,

however, there is found no literal support in the specification for the newly added limitation in amended claim 1. Applicants have not provided the page number and line numbers from the specification as to where the newly added limitations are coming from. *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983) *aff'd mem.* 738 F.2d 453 (Fed. Cir. 1984).

**II.** Claims **1-2, 4-6 and 8-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

line 10, it appears that the “powdered MgO” is the same as the magnesium oxide recited in claim 1, line 6. However, it is unclear if it is. If it is not, then what is the relationship/ difference between the powdered MgO and the magnesium oxide?

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Edna Wong/  
Primary Examiner  
Art Unit 1795

EW  
March 23, 2008